

Upland Habitat Weed Management Plan  
for the  
Don Edwards San Francisco Bay National Wildlife Refuge  
Environmental Education Center  
Alviso, California  
(Updated August 2005)

## Introduction

The purpose of this plan is to outline the current status of invasive weeds at the Environmental Education Center and to provide a detailed plan of action to reduce and/or eradicate invasive weeds from the area. This plan promotes adaptive management concepts by evaluating different weed eradication techniques as they are implemented. Additionally, a monitoring protocol is described which will enable Refuge staff and volunteers to evaluate weed reduction techniques in relation to the objectives and facilitate adaptive management.

## Site Description

The Environmental Education Center (EEC) is part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). The Refuge currently encompasses approximately 30,000 acres of salt ponds, salt marsh, seasonal wetlands, mudflats, uplands and open water. The EEC is located in Alviso, Santa Clara County, California and comprises 20 acres of the total Refuge. The EEC is a valuable natural resource supporting a rich diversity of habitats and a variety of aquatic and terrestrial biological resources. Additionally, the EEC plays a key role in promoting public awareness of natural resource conservation through its many educational programs. Currently, the upland areas (approximately 12 acres) of the EEC are infested with a variety of invasive weeds that degrade the value of habitat to wildlife and make it less suitable for educational purposes.

## Goals

1. To enhance existing upland habitat for the benefit of native wildlife, especially neo-tropical migratory birds.
2. To incorporate the upland restoration process into education programs at the EEC to demonstrate the importance of native plants for ecosystem health and promote gardening with native plants.

## Objectives

1. To reduce invasive weed infestations and eliminate residual seed banks.
2. To re-vegetate areas that have undergone weed control with native plants.
3. To greatly reduce Refuge staff and volunteer time required to maintain weed-free, upland habitat and to eliminate maintenance in certain areas altogether.
4. To establish native plants that are suitable for the area and do not require additional water once established in all areas beyond the demonstration gardens by the buildings.
5. Recruit local volunteers to conduct regular maintenance and establish a schedule of monthly weeding/planting work parties.
6. Create a feasible work schedule that is easily implemented by Refuge maintenance staff.
7. Protect existing wildlife habitat and human health by making sure we use the proper chemicals in a safe way by staff and volunteers who have proper training and equipment.

## Weed Management Zones

The upland habitat at the EEC is divided into four separate areas, plus the edge of the entrance road, each comprised of various zones as listed below. Each zone is a distinct area of the EEC defined by location, weed distribution, or function. Each zone requires slightly different weed management/re-vegetation techniques that will be covered in the following sections. Refer to Figure 1 for a map of the zones.

- I. Garden Area
  - A Butterfly Garden
  - B Migratory Songbird Garden (near pavilion)
  - C California Habitat Demonstration Garden
  - I Bioswale
  - J Parking lot median
- II. West End Area
  - D Levee Trail Zone– upland zone from garage to the floating dock
  - D1 Artesian slough side of paved levee and graveled levee, from cottonwood trees to the floating dock
  - D2 New Chicago Marsh side of paved levee & gravel to boardwalk
  - D3 Chicago Marsh “Flats”
  - D4 Ditch with tree
  - D5 Garage ditch
  - D6 Garage work area
  - F Butterfly Garden Bank to boardwalk
  - K Artesian Slough Berm from garage along road to east
- III. Pavilion Field Area
  - E Pavilion Hill
  - G Pavilion and beyond bank
  - G1 Bank from boardwalk ramp to ravine
  - G2 Bank from ravine past pumphouse
- IV. Pumphouse Field Area (East end)
  - H1 Upper Pumphouse Field
  - H2 Lower Pumphouse Field
- V. Entrance Road

## Upland Habitat Management Strategies

Native upland habitat enhancement at the EEC requires the removal of invasive weed infestations, the establishment of a habitual weed control program, and re-vegetation of newly weed-free areas. The removal methods and level of maintenance effort will vary by zones, as will the effort put forth to establish native vegetation.

### Removal of current, large-scale weed infestations/Maintenance of weed control

Certain zones contain dense infestations of invasive weeds. These areas will require significant effort for the first few years this plan is in place. Potential strategies for removing these large-scale infestations include:

- Herbicide spraying prior to seed set.
  - Spot spraying backpack, garden\*
  - Herbicide spraying truck, ATV\*
  - Aquamaster, 1 ½ % or 2 ounce per gallon
- Mowing prior to seed set. Mowing may be done with either tractor\* or small machine\*

mowers as appropriate. (bagging and/ or disposing of mowed vegetation will be done if needed to prevent seed drop).

- Hand tools, including weed-whackers or scythes, to remove dead weedy vegetation and kill young weeds after germination.
- Hand pulling larger weeds prior to seed drop in wet weather is very effective.
- Flaming in wet weather
- 5% vinegar on cotyledons
- The possible use of pre-emergent such as Surflan in the fall at the start of the rainy season is to be determined (must be approved). It will be a very effective way to help deplete the seed bank in most of the EEC upland areas if its use is approved.

\*Exceptions are:

- 1) Chemicals may not be used in the Butterfly Garden Area (we need to meet with Joy to see if Rodeo etc. is a harmful chemical in this sense because it is the only sure way to get rid of pepperweed. Even if carefully applied by hand?)
- 2) Mowing is generally not appropriate in the garden areas and not possible on the bank areas. Debris will limit its use in the lower pump house field areas. (Remove?)

Note: Mowing of deep rooted plants like thistle, hemlock or perennial mustard should only be done to buy time if spraying can't be done early enough or as a last resort to reduce seed yield from large patches in the outer areas

### Monitoring of Weed Removal

Throughout the year volunteers and staff periodically monitor the progress of the project. As weeds are removed, method of removal and the areas worked are tracked using maps and by maintaining a log book. In addition, volunteers and staff survey the weed management zones and map the species and density of the weeds in each zone.

### Native Plant Re-Vegetation

Planting native plants in areas in which weeds have been successfully removed serves two purposes. The first is to prevent re-establishment of invasive weeds. The second is to create native upland habitat that is beneficial to wildlife and demonstrates to the public the potential to create attractive, backyard habitats for birds and butterflies within urban areas. The native plants will be acquired from the Native Plant Nursery in Fremont or if a special plant is needed that is not grown in Fremont, we would purchase plants from a local native plant nursery using grant funds. The plants would need to be hand watered for approximately two summers. We will look into purchasing a water tank that can be placed on the motorized hand cart that is stored in the garage at the EEC. Once established, the native plants will not require water and will therefore not increase necessary maintenance effort. Additionally, placards will be placed in the butterfly and songbird demonstration gardens to provide information about the specific native plants to Refuge visitors and education program participants.

### Target Weed Species

The following list includes target invasive weed species present in upland habitat at the EEC (In approximate order of importance):

<b>Weed</b>	<b>Invasive Plants of California Wildlands</b>
Perennial Pepperweed ( <i>Lepidium latifolium</i> )	(Bossard <i>et al</i> , p. 222)
Poison Hemlock ( <i>Conium maculatum</i> )	(Bossard <i>et al</i> , p. 120)
Italian Thistle ( <i>Carduus pycnocephalus</i> spp.?)	(Bossard <i>et al</i> , p. 86)

Mustard ( <i>Brassica spp.</i> )	(Bossard <i>et al</i> ,p. 68)
Horehound ( <i>marrubium?</i> )	(Jepson, p. 715)
Stinkweed ( <i>Dittrichia graveolens</i> )	
Tocolote ( <i>Centaurea melitensis</i> )	
Vetch?	(Bossard <i>et al</i> , p. 98)
Grasses- misc (sp?)	
Fennel ( <i>Foeniculum vulgare</i> )	(Bossard <i>et al</i> , p. 198)
Mustard- annual (sp?)	
Bull thistle ( <i>Cirsium vulgare</i> )	(Bossard <i>et al</i> , p. 112)
Harding grass ( <i>phalaris aquatica?</i> )	(Bossard <i>et al</i> , p. 262)
Teasil?? ( <i>Dipsacus..fullonum? or sativus?</i> )	(Jepsen, p. 540)
Tobacco tree?	
Jubata?	
Tree of heaven ( <i>Ailanthus altissima</i> ) (bioswale north end only?)	
Stinging nettle? (Garden areas mainly)	
<i>Bassia hyssopifolia or Kochia scoporia</i> (salt pond levee, first seen, summer 2005)	

## Zone Descriptions and Weed Control Tactics

\*\*\* Refer to the site maps for location, sizes, and priorities

### I. Garden Area

#### A Butterfly Garden:

*Description:* This zone is to the north-east of the main building at the EEC. It has a small series of trails that were built by volunteers and staff. Currently, zone is defined by the extent of large native plants. There is a bench for visitors and 2 “interpretive” signs along the trails.

*Background Information:* In 1990, this zone was a hill of mustard, thistle, and poison hemlock. Through the collaborative efforts of the Urban Runoff Interpretive Specialist, the EEC Director, Refuge maintenance staff, and many volunteers, this zone was transformed into a functional native plant demonstration garden. The restoration emphasis for this area was to provide native plant habitat for butterflies. All of the native plants that were planted in this zone serve a function for various local species of butterflies in their various stages of life (caterpillar, chrysalis, and eggs). The first stage of tackling this zone was to reduce the amount of weeds that grew in the zone using hand-pulling, weed-whacking, and mowing methods. Weed cloth and mulch were put in place to keep this zone free of weeds. In addition, a drip irrigation system was installed to help water the newly planted native plants in this zone. Because these were the first few steps in the weed removal and native planting process in the upland at the EEC, this was a time of learning the best methods for reducing weeds and planting native plants in this upland zone. This zone is chemical- free to provide a demonstration garden for the Urban Runoff Pollution Prevention Program and for the butterflies that depend on the native plants.

#### *Weed Control:*

- Hand weeding and hand tools- 6 times or more per year (EEC staff and volunteers)
- Maintain a thick layer of mulch
- No chemicals

*Re-vegetation:* This zone is well vegetated with natives. It will be necessary to plant this zone periodically as older plants die and create space in the garden. Note: Milkweed is a plant that has not had much success lately but is an important plant for this part of the garden. More effort needs to be spent on planting milkweed in this zone.

*Additional Plans:* Apply for grants for things such as:

- Plant identification signs need to be revamped, reprinted, laminated with uv resistant laminant material and placed in the garden- (EEC Staff and volunteers).
- The two “interpretive” signs should be replaced with real interpretive signs about the butterfly garden. New signs would need to be designed and fabricated by an outside source.

## **B Migratory Songbird Garden:**

*Description:* This zone is located near the entrance to the Pavilion, which is south-east of the EEC, across the parking lot. It extends along the south-east edge of the parking lot adjacent to the entire length of the sidewalk. There is one gold-fines trail that leads to the Pavilion and a bench within the garden.

*Background Information:* This zone is an extension of the butterfly garden but with a theme of songbirds. Methods similar to creating the butterfly garden were used to develop this part of the garden near the pavilion. Hand – pulling, weed-wacking, and mowing methods were used to reduce the amount of weeds that grew in this zone. Weed cloth (not in all parts of this zone) and mulch were put in place to keep this zone weed free. However this zone does not have a drip irrigation system. When young native plants are planted here they must be hand watered. There are a variety of small trees and bushes suitable for songbird habitat. This garden is also chemical free and serves as a demonstration garden for the Urban Runoff Pollution Prevention Program and for the songbirds that depend on the native plants.

*Weed Control:*

- Hand weeding and hand tools- 3 times or more per year (EEC staff and volunteers)
- Maintain a thick layer of mulch (Note: Mulch should not be placed near the pavilion structure in order to prevent fire and maintain the structural integrity of the pilings)
- Limited chemicals

*Re-vegetation:* This zone is fairly well vegetated. Additional native plants suitable for songbirds could be supplemented into the sparse areas.

*Additional Plans:* Apply for grants for things such as:

- This zone has thank you placards to companies and individuals who donated money towards the gardens. These need to be investigated and placed in the garden. (There might be some for the butterfly garden too). (EEC Staff and volunteers)
- Interpretive sign explaining the function of the garden would be ideal. The design and fabrication could be from an outside source.

## **C California Habitat Demonstration Garden:**

*Description:* This zone is located to the south-east of the EEC, between the building and

the propane tank. There is a sidewalk, and gold-fines trail that lead through this garden. There is a bench that overlooks New Chicago Marsh.

*Background Information:* This zone is also an extension of the butterfly garden, with the general theme being California Habitats. This garden shows off native plants that are suitable for planting in a home garden. Methods similar to creating the butterfly and songbird gardens were used to develop this part of the garden near the pavilion. Hand-pulling and weed-whacking methods were used to reduce the amount of weeds that grew in this zone. Weed cloth (not in all parts of this zone) and mulch were put in place to keep this zone weed free. In addition, this zone has a drip irrigation system. This garden is also chemical free and serves as a demonstration garden for the Urban Runoff Pollution Prevention Program.

*Weed Control:*

- Hand tools and hand weeding (because of the native plants) - 3 times or more per year (EEC staff and volunteers)
- Maintain a thick layer of mulch
- Limited Chemicals

*Re-vegetation:* This demonstration garden still needs to be fully planted. During Spring 2004, part of this garden was torn up to install a propane line from a new propane tank to the building. We began re-vegetation in Fall 2004. However, more plantings should be done in the 2004-2005 planting season (December – February).

*Additional Plans:*

-Plant identification placards should be created and installed in this portion of the garden. (EEC staff and volunteers)

## **I Bioswale**

*Description:* The bioswale is located in the center of the parking lot, it is the zone on the pavilion side. It has a variety of plants that thrive in a freshwater marshy environment (rushes, willows, sedges, fuschias, yellow-eyed grass). It has a small bridge built over the middle of the zone to provide access through the parking lot and to the pavilion and the EEC.

*Background Information:* The bioswale was created in 2001 as part of the parking lot reconfiguration project. The parking lot was designed to slope on either side of the bioswale, making the bioswale the lowest point within the parking lot. The bioswale acts as a filtration system for rain water. The rain flows from the paved surfaces of the parking lot to the bioswale, the water is filtered through the plants and soil and then flows to New Chicago Marsh via a storm drain. This zone provides a wonderful example for the Urban Runoff Pollution Prevention Programs and Garden Projects. In the winter, this zone acquires a lot of water from the rain, shallow pools of water form creating a great environment for the rushes, willows and sedges that are planted at the lowest point within the zone. The fuschias and yellow-eyed grass do not need a lot of water and are planted in the higher part of the bioswale. However, in order to maintain the plants that need a lot of freshwater in the summer, a drip irrigation system was installed. There are 3-4 zones within the bioswale. Each drip irrigation zone is controlled via a control system located in a green plastic box in the bioswale. The batteries for the system need to be

replaced every 6-8 months. The directions on how to set the system are on the cover for the pipes within the green box. Each box is marked with a red flag. Weed cloth and mulch are placed throughout this entire zone. This garden is also chemical free and serves as a demonstration garden for the Urban Runoff Pollution Prevention Program.

*Weed Control:*

This zone was planted in 2001. It has a recurring problem with weeds, tree of heaven, tarweed, and some unknown weeds.

- Hand tools and hand weeding (because of the native plants) - 3 times or more per year (EEC staff and volunteers)
- Maintain a thick layer of mulch
- No Chemicals

*Re-vegetation:* This zone is well-vegetated. The willows that have grown voluntarily will need to be maintained by periodically trimming them back to make sure they do not take over and make it difficult for law enforcement and visitors to see around the corners and the parking lot. It will be necessary to plant this zone periodically as older plants die and create space in the bioswale. There are only a certain number of spots that can be planted due to the limitation of the drip irrigation system.

*Additional Plans:* Apply for grants for things such as:

- Interpretive signage along the bridge to explain the purpose of the bioswale (contracted ) and plant identification signs installed throughout the bioswale (volunteer).

## **J Parking lot median**

*Description:* This zone is located in the middle of the parking lot, it is the zone on the EEC side of the parking lot. It is an elevated median surrounded by cement curbs.

*Background Information:* This zone was created in 2001 as part of the parking lot configuration project. It does not have drip irrigation installed, however, a portion of the median is piped for water. A portion of this zone has weed cloth and the entire zone is covered in mulch. It has been difficult to plant this area due to the lack of drip irrigation, its elevated height encourages the soil to dry out quickly. There have been 2-3 attempts made to plant this zone. Some of the plants have survived with careful hand watering.

*Weed Control:*

- Hand tools (EEC Staff/ volunteers)
- Herbicides (Maint. Staff)
- Maintain a layer of mulch (Note: the mulch gets kicked off the median by visitors and ends up in the parking lot, so this is difficult to maintain)

*Re-vegetation:* A portion of this zone has been planted. However it is quite sparse. More plants should be planted in this zone to maintain an aesthetically pleasing atmosphere for visitors. In addition, these plants should be low growing and robust to withstand visitors walking through the median area and sometimes trampling the plants. It would be worth reinvestigating whether or not we can get drip irrigation equipment installed in this zone. This would assist in the planting of native plants in this difficult zone.

*Additional Plans:*

- Feasibility of installing a drip irrigation system will be investigated
- Consider filling with concrete as an alternative

## **II. West End Area**

### **D Levee Trail Zone– upland zone from garage to the floating dock:**

*Description:* This zone extends from the garage to the floating dock along either side of the levee trail (both paved and graveled trail). The levee trail is an access point to the Mallard Slough Loop Trail (5.5 miles) and part of the accessible New Chicago Marsh Loop Trail (0.25 miles). A low fence borders the New Chicago Marsh side of the paved portion of the levee trail.

*Background Information:* The majority of this levee was rebuilt in the early 1980's by the City of San Jose with fill that was heavily laden with asbestos material. During this time, the levee was built, reinforced, and pipes were installed to prevent flooding of New Chicago Marsh and Alviso during periods of reoccurring major flooding in the early 1980's. Because of the high levels of asbestos, this levee was deemed a superfund site and was contained with a cap of gravel. In the Fall of 2003, the Environmental Protection Agency and the City of San Jose teamed up to remove the asbestos material and replace it with clean fill. Before this construction project this zone was overrun with tobacco tree, pepperweed, poison hemlock, and thistle. After the construction we have had the opportunity to keep the weeds to a minimum. As part of the construction project they placed plastic netting with straw and native grass seeds in hopes of encouraging native plants to grow. Unfortunately, this proved unsuccessful and only thistle, pepperweed, and poison hemlock began to grow. In addition, the netting had to be removed because it was trapping and killing wildlife such as birds and snakes. This past year we have sprayed these zones with Rodeo herbicide to reduce the weed growth. The portion of the zone along the graveled salt pond levee had dredge spoils from salt pond dredging operations piled up in the late 1990's. The levee was leveled out in 2001 and a surface of accessible materials was placed on top. This zone has not been disturbed since. Because this zone is quite long and has different conditions and needs we have broken it up in to sub-zones for a better reference.

#### **D1 Artesian slough side of paved levee and graveled levee, from cottonwood trees to the floating dock**

*Weed Control:* The majority of this zone is quite steep and unstable, it extends from the levee trail to the edge of the tule in Artesian Slough. An attempt at reseeding occurred on the portion of this zone adjacent to the paved levee, it proved unsuccessful. In the Spring of 2004, Rodeo was used to kill the weeds in this zone (thistle, poison hemlock, mustard, and pepperweed). Because this zone is new fill that was disturbed a lot of weeds grow here.

A combination of the following methods can be used:

- Hand spraying
- Hand pulling

The portion of this zone adjacent to the gravel levee has a dense population of pepperweed and poison hemlock. In the Spring of 2004 a group of volunteers removed the pepperweed stalks which contained seeds. **The roots of pepperweed and poison hemlock still remain.**

A combination of the following techniques can be used:

- Hand-spraying
- Hand-pulling

Since this area is steep only supervised volunteers and staff working in pairs will be allowed to work in this area.

*Re-vegetation:* The portion of this zone adjacent to the paved levee will need to be re-vegetated to maintain the integrity of the levee as well as assist in maintaining a weed free zone. However, a list of plants suitable for these conditions needs to be generated with the assistance of the Native Plant Nursery volunteers and input from biologists. This is a medium to high priority. The portion of the zone along the graveled levee will not need to be re-vegetated, just maintained as a weed free zone.

*Additional Plans:* No additional plans at this time.

## **D2 New Chicago Marsh side of paved levee**

*Weed Control:* An attempt at reseeding occurred in this portion of the zone as well. It also proved unsuccessful. In the Spring of 2004, Rodeo was used to kill the weeds in this zone (thistle, poison hemlock, mustard, and pepperweed). Because this zone is new fill that was disturbed, weeds are prolific here. Part of this zone is quite steep and unstable.

Because of the steepness of a portion of this zone, a combination of the following can be used:

- Hand spraying
- Hand pulling

*Re-vegetation:* This zone will need to be revegetated to maintain the integrity of the levee as well as to assist in maintaining a weed free zone. However, a list of plants suitable for these conditions needs to be generated. This is a medium to high priority.

*Additional Plans:* No additional plans at this time.

## **D3 Chicago Marsh “Flats”**

*Weed Control:* This zone was cleared of the old hemlock stands in the Fall of 2003 by the CCC crew. In the Spring of 2004, poison hemlock and mustard seedlings were rapidly growing. This zone was hand-sprayed with Rodeo to reduce the weed growth.

This zone can be maintained by a combination of the following techniques:

- Hand tools
- Hand-spraying
- Mowing

*Re-vegetation:* This zone will need to be re-vegetated to help maintain a weed free zone and create habitat. However, a list of plants suitable for these conditions needs to be generated. This is a medium to high priority.

*Additional Plans:* No additional plans at this time.

#### **D4 Ditch with tree**

*Weed Control:* This zone had a new cottonwood tree planted by the City of San Jose in Spring 2004 as part of the re-vegetation project associated with the asbestos removal. It will need to be watered for at least two summers. In addition, the zone was cleared by the CCC crew in Fall 2003. There are a few remnant invasive plants remaining.

This zone can be maintained by a combination of the following techniques:

- Hand tools
- Hand-spraying
- Mowing

*Re-vegetation:* This zone has a high density of coyote brush, and soap root. A few additional plants could be planted to help maintain a weed free zone. This is a low to medium priority.

*Additional Plans:* No additional plans at this time.

#### **D5 Garage ditch**

*Weed Control:* This zone has not been too much of a problem in the past.

This zone can be maintained by a combination of the following techniques:

- Hand tools
- Hand-spraying
- Mowing

*Re-vegetation:* This zone could be planted with mugwort, a riparian plant. This serves as a drainage ditch, so too much vegetation could cause problems. This is a low to medium priority.

*Additional Plans:* No additional plans at this time.

#### **D6 Garage work zone**

*Weed Control:* This zone needs to be kept clear for a work area. This zone has not been too much of a problem in the past.

This zone can be maintained by a combination of the following techniques:

- Hand tools
- Hand-spraying
- Mowing

*Re-vegetation:* This zone will not be re-vegetated in order to maintain it as a work area for parking trucks, mulching machines, as well as piles of mulch, etc. In addition, a vegetation free zone needs to be maintained around the garage to prevent fires.

*Additional Plans:* No additional plans at this time.

### **F Butterfly Garden Bank**

*Description:* This zone is the bank adjacent to the butterfly garden from the paved levee trail to the corner of the EEC. A walking trail follows the entire length of the bank.

*Background Information:* A small portion of this bank was planted with native plants such as California sage, and St. Catherine's lace in the late 1980's. Coyote brush has grown on its own in certain areas of the bank. A large portion of the bank is extremely steep and difficult to access. In addition, these portions have some extremely dry soil conditions and even have cement blocks and pipes buried along the bank. As a result, these sections have had an extremely dense population of perennial mustard. An attempt was made in 2000 to cover the area with weed cloth, but the weed cloth that was used was not appropriate for steep slopes, mulch could not be placed on top of the cloth. Four years later the weed cloth was removed. During fall 2003, the CCC crew cleared this zone of mustard, the main weed in this area. During spring 2004, the area was sprayed with Rodeo/ Aqua master herbicide.

*Weed Control:*

- Hand tools
- Hand-spraying
- Note: Weed cloth should not be used unless it is designed for hill sides. Mulch should also not be used in this zone.

*Re-vegetation:* Re-vegetation is necessary for a large portion of this bank. However, it will prove to be difficult because of the cement blocks, and steepness of the bank. Extremely drought tolerant plants such as California sage will need to be planted in this zone.

*Additional Plans:* There are no additional plans at this time.

## **K Artesian Slough Berm**

*Description:* The berm is located on the Artesian Slough side of the entrance road. It runs the length of the road from the curve to the parking lot.

*Background Information:* The original berm was put in place in the early 1980's by the City of San Jose to prevent additional flooding from Artesian Slough to the town of Alviso. The same fill was used here as in the levee, and as a result also contained high levels of asbestos. In the Fall of 2003, the Environmental Protection Agency and the City of San Jose teamed up to remove the asbestos material and replace it with clean fill. Before this construction project this zone was capped to prevent the asbestos material from becoming airborne, as a result, not much could grow here. As part of the construction project they placed plastic netting with straw and native grass seeds in hopes of encouraging native plants to grow. Unfortunately, this proved unsuccessful and only thistle, pepperweed, and poison hemlock began to grow. In addition, the netting had to be removed because it was trapping and killing wildlife such as birds and snakes. This past year we have sprayed these zones with Rodeo herbicide to reduce the weed growth.

*Weed Control:*

- Hand tools
- Hand-spraying
- Note: Weed cloth and mulch are not recommended for this zone.

*Re-vegetation:* Re-vegetation is necessary for this zone. The requirements include planting plants that are low-growing and drought tolerant.

*Additional Plans:* There are no additional plans at this time.

### **III. Pavilion Field Area**

#### **E Pavilion Hill**

*Description:* The pavilion hill stretches east from the Migratory Songbird Garden to the ravine.

*Background Information:* In the past this zone contained the “Ohlone” Village, which consisted of a lean-to and fire pit for the summer camp overnight program. This zone had a dense stand of mustard, poison hemlock, and fennel. Each summer this area would be mowed or weed whacked to provide access to the “Ohlone” Village area for summer camp programs. In 2000, during the parking lot construction, fill was placed in this area, which raised the elevation of a portion of the bank. After this time, the lean – to was deemed unsafe and torn down. In addition, the series of major construction projects, such as the Shelter in place, and the asbestos removal project turned a portion of this area into a temporary truck parking lot and area for storing materials and equipment for the construction projects. This area is no longer used for summer camp sleepovers. As a result of this activity, the original mustard stand was leveled which provided us with the opportunity to maintain this zone as weed free. The past few years (2001-2004), this area has been sprayed, mowed, and cleared by the CCC crew of pepperweed, tarweed, mustard, and thistle.

*Weed Control:* Even though this area was cleared of dense stands of hemlock, thistle, mustard, this zone has been disturbed a lot and is prone to rapid weed growth. Large patches of re-sprouts and new weeds are still expected in some places due to the extent of the seed bank and continued disturbance of the area, but abundance should decline with time. Control of these resprouts can be maintained using:

- Hand tools
- Hand-spraying
- Mowing

Within the next one to two years, we hope to have significantly diminished all major weed infestations.

*Re-vegetation:* In order to help maintain a weed free zone, this zone will need to be re-vegetated with native plants. Because there are no plans for installing drip irrigation this far out on the upland, it has been suggested that we plant creeping wild rye in this zone, which will help keep down unwanted weeds. And then we can plant other native plants. It is a high priority to attempt a test plot of creeping wild rye to find out if this is a viable alternative. If it is, then it will remain a high priority (once the weeds are more under control- in a season or two) to plant creeping wild rye in more portions of this zone, and develop a diverse plant list for this zone. If weed eradication is successful, re-vegetation should begin in winter 2006.

*Additional Plans:* It has also been suggested that this could be a great zone for burrowing owls. An artificial burrow could be built in this zone for about \$50. Once we see if they are being utilized, more could be built in the future in this zone and Zone G and H. This proposal will be researched to ensure that a new owl using the artificial burrow would not disturb existing nesting sites that are being used by owls each season.

## **G Pavilion and beyond bank**

*Description:* This zone stretches from the New Chicago Marsh corner of the EEC, past the boardwalk, and past the pumphouse. It includes the banks of the upland only.

*Background Information:* The portion of this zone between the corner of the EEC and the boardwalk (G1) was planted with native plants in the late 1980's. These plants are doing well and have kept this portion of the zone weed free. The portion of the zone that stretches from the boardwalk to the ravine (G1) had an extremely dense stand of mustard. Over the period of 2-3 seasons, manual techniques using scythes were utilized to remove the mustard (old stands and new sprouts). As a result, the thick stands of mustard are gone. After this initial effort, herbicides were sprayed in 2004. The new weeds in this zone have been greatly reduced. The portion of the zone that stretches from the ravine past the pumphouse (G2) was sprayed using herbicides but needs more for hemlock and pepperweed.

*Weed Control:* This zone still continues to have recurring problem with mustard, pepperweed, thistle, and tarweed (even though populations of these species have been greatly reduced).

The following techniques may be used in this zone:

- Hand tools (uneven slope of the bank)
- Hand-spraying
- Note: Weed cloth and mulch are not recommended for these zones.

*Re-vegetation:* This zone will also need to be re-vegetated. This zone is also a candidate for creeping wild rye. See the info in zone E. Salt grass is another alternative.

*Additional Plans:* There are no additional plans at this time.

## **H Pumphouse Field**

*Description:* This zone is broken up into two sub zones. The upper pump house field (zone H1) extends from the eastern edge of zone E, just past the ravine, it includes the hilltop, its farthest edge is bordered by coyote brush and the maintenance road to the pumphouse. The lower pumphouse field (zone H2) extends from the maintenance road to through the remaining portion of the upland area.

*Background Information:* This zone has an extensive patch of harding grass, pepperweed, fennel, and poison hemlock. This area is also filled with cement blocks and culverts, so mowing may not be an option for a large portion of this area. In the early 1990's a portion of this zone had a prescribed burn to help reduce the amount of weeds. Nothing much has been done in this zone since then, except in the Spring 2004 the CCC crew began to clear out the large patch of pepperweed.

*Weed Control:* Because of the size of this part of the upland, this zone will need to maintained by:

- Hand-spraying
- hand tools
- Some mowing where safe (cleanup so okay for tractors?)

*Re-Vegetation:* This zone will need to be re-vegetated. This zone could also be a candidate for creeping wild rye. See the info in zone E.

*Additional Plans:* A portion of this zone could also be prime habitat for an artificial nest for burrowing owls.

